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# An empirical examination of initial trust in mobile banking

Initial trust in  
mobile banking

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## Abstract

**Purpose** – The purpose of this paper is to examine the effect of initial trust on mobile banking user adoption.

**Design/methodology/approach** – Based on the valid responses collected from a survey questionnaire, structural equation modeling (SEM) technology was employed to examine the research model.

**Findings** – The results indicate that structural assurance and information quality are the main factors affecting initial trust, whereas information quality and system quality significantly affect perceived usefulness. Initial trust affects perceived usefulness, and both factors predict the usage intention of mobile banking.

**Research limitations/implications** – The sample was mainly composed of users having rich mobile Internet experience, which may affect their trust in mobile banking. Future research needs to generalize these results to other samples, such as those users without much mobile Internet experience.

**Originality/value** – Extant research has mainly adopted information technology adoption theories such as TAM to explain mobile user behavior, and has seldom examined the effect of initial trust on mobile banking user adoption. However, the high perceived risk and low switching cost highlight the necessity to build initial trust to facilitate user behavior. This research fills the gap.

**Keywords** Initial trust, Mobile banking, Information quality, System quality, Trust, Banking

**Paper type** Research paper

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## Introduction

The application of third generation (3G) mobile communication technologies has triggered the rapid development of mobile commerce. A report issued by China Internet Network Information Center (CNNIC) indicates that the number of mobile Internet users has exceeded 303 million, accounting for 66 percent of the Internet population (457 million) (CNNIC, 2011). In the United States, about 59 percent of the adult people go online wirelessly (PewInternet, 2010). A variety of mobile services such as mobile instant messaging, mobile search and mobile music have been very popular among users. These services are mainly related to communication, information and entertainment application. However, mobile transaction services such as mobile banking have been adopted by a minority of users. For example, only 7.1 percent of mobile users have ever used mobile banking (CNNIC, 2011). Many traditional banks such as the Industrialized and Commercial Bank of China (ICBC), which is the largest commercial bank in China, have released their mobile banking services. In order to achieve success, a prerequisite is to facilitate user adoption and usage of mobile banking.



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Mobile banking means that users adopt mobile terminals to conduct payment such as balance enquiry, transference and bill payment at anytime from anywhere (Dahlberg *et al.*, 2008). Mobile banking frees users from spatial and temporal limitations, and enables them to conduct ubiquitous payment. This provides great convenience to users. However, due to the virtuality and lack of control, mobile banking involves great uncertainty and risk. Thus users need to build trust in order to adopt and use mobile banking. Initial trust develops when users interact with mobile banking for the first time (McKnight *et al.*, 2002a). Establishing users' initial trust is critical for mobile service providers. On one hand, due to the lack of previous experience, users will perceive great uncertainty and risk when they adopt mobile banking for the first time. They need to build initial trust to overcome perceived risk. On the other hand, the switching cost is low. Users may switch back to online banking if they cannot build initial trust in mobile banking. Thus mobile service providers need to engender users' initial trust to acquire and retain them.

Extant research has used information technology adoption theories such as technology acceptance model (TAM) (Kim *et al.*, 2010; Schierz *et al.*, 2010), innovation diffusion theory (IDT) (Mallat, 2007), and the unified theory of acceptance and use of technology (UTAUT) (Luo *et al.*, 2010) to examine mobile banking user behavior. Perceived usefulness, relative advantage and performance expectancy are found to affect user adoption of mobile banking. However, the effect of initial trust on mobile banking user behavior has seldom been examined. As noted earlier, the high perceived risk and low switching cost highlight the necessity to build users' initial trust in order to facilitate their adoption and usage of mobile banking. The purpose of this research is to identify the factors affecting initial trust in mobile banking. We draw on two factors including information quality and system quality from information system success model. In addition, structural assurance and trust propensity are also included as the determinants of initial trust.

The rest of the paper is organized as follows. We review related literature in the next section. Section three presents the research model and hypotheses. Section four reports instrument development and data collection. We present data analysis and results in section five, followed by a discussion of these results in section six. Section seven presents the theoretical and managerial implications. We summarize the limitations and conclude the paper in section eight.

## Literature review

### *Initial trust*

Due to the great uncertainty and risk involved in online transactions, trust has received considerable attention in the electronic commerce context. Trust has been found to affect user adoption of various services, such as online news services (Chen and Corkindale, 2008), Internet banking (Flavian *et al.*, 2005), health web sites (Fisher *et al.*, 2008), and mobile shopping (Lu and Su, 2009). Trust includes initial trust and continuance trust. As the first stage of trust development, initial trust is significant for user behavior and various factors have been identified to affect initial trust. The first category of factors is associated with website. Due to the lack of previous experience, users will rely on their perception of website quality to build initial trust (Lowry *et al.*, 2008). In addition, information quality has been found to affect initial trust in health infomediaries (Zahedi and Song, 2008). Other factors such as website appeal and usability also affect online consumers' initial trust (Hampton-Sosa and Koufaris, 2005).

The second category of factors is associated with the consumer. Trust propensity has a significant effect on initial trust (Li *et al.*, 2008), although this effect may gradually diminish with increased experience (Zahedi and Song, 2008). The third category of factors is associated with company. Reputation, company size and corporate image act as trust signals and will affect consumers' initial trust (Flavian *et al.*, 2005; Chen and Barnes, 2007; Fuller *et al.*, 2007). The fourth category of factors is associated with third parties. Consumers may transfer their trust in third parties to online vendors. Web assurance seals such as VeriSign and TRUSTe are found to affect initial trust (Hu *et al.*, 2010). Brand association and portal affiliation also affect online consumers' initial trust (Delgado-Ballester and Hernandez-Espallardo, 2008; Sia *et al.*, 2009).

Similar to online transactions, mobile commerce also involves great uncertainty and risk. Thus trust is critical to facilitating mobile user behavior. However, compared to the abundant research on online trust, there exists less research on mobile trust. Siau and Shen (2003) divided mobile trust into initial trust and continuous trust, both of which are affected by the factors related to mobile vendor and technology. Li and Yeh (2010) noted that design aesthetics affect mobile trust through perceived usefulness, perceived ease of use and customization. Lee (2005) examined the effect of mobile interactivity on user trust. Mobile interactivity includes user control, responsiveness, personalization, connectedness, ubiquitous connectivity and contextual offer. Chandra *et al.* (2010) reported the effect of trust on user adoption of mobile payment systems.

#### *Mobile banking adoption*

As an emerging service, mobile banking has not been widely adopted by users. Thus researchers have paid attention to identify the factors affecting user adoption. Information technology adoption theories such as TAM, IDT and UTAUT are often used as the theoretical bases. Gu *et al.* (2009) found that structural assurance and perceived ease of use affect trust in mobile banking. Lin (2011) drew on IDT and trust theory to examine the effects of innovation attributes and knowledge-based trust on mobile banking adoption. Innovation attributes include relative advantage, compatibility and perceived ease of use. Knowledge-based trust includes perceived competence, benevolence and integrity. Kim *et al.* (2009) reported that structural assurance, relative benefits and personal propensity to trust affect initial trust in mobile banking. Zhou *et al.* (2010) integrated UTAUT and task technology fit theory to examine user adoption of mobile banking. Luo *et al.* (2010) found that performance expectancy and perceived risk have significant effects on the intention to use mobile banking services.

### **Research model and hypotheses**

#### *Information quality*

As noted earlier, due to the lack of direct experience, users need to rely on their own perceptions such as information quality and system quality to form their initial trust in mobile banking. Both information quality and system quality are the factors affecting information system success (DeLone and McLean, 2003). Information quality reflects information relevancy, accuracy and timeliness (Kim *et al.*, 2004). Users expect to access mobile banking to acquire their payment information at anytime from anywhere. If the information provided to them is irrelevant, inaccurate and out-of-date, users may doubt whether mobile service providers have enough ability and benevolence to provide quality services. Thus information quality will affect initial trust. For example, if mobile

banking is asynchronous with online banking, users may acquire wrong information on account balance when they have conducted payment with online banking. This will decrease users' trust in mobile banking. In addition, information quality may also affect perceived utility of mobile banking. Users rely on quality information to conduct ubiquitous payment, which improves their living and working performance and effectiveness. In contrast, low quality information will decrease users' perceived utility of mobile banking. Prior studies have noted the effect of information quality on initial trust in health infomediaries (Zahedi and Song, 2008). Information quality also affects perceived usefulness of data warehousing software (Wixom and Todd, 2005). Thus:

- H1. Information quality positively affects initial trust.
- H2. Information quality positively affects perceived usefulness.

#### *System quality*

System quality reflects the access speed, ease-of-use, navigation and appearance of mobile banking (Kim *et al.*, 2004). Due to the constraints of mobile terminals such as small screens and inconvenient input, users may find it difficult to search for information with mobile banking. Thus an interface with powerful navigation, clear layout and prompt responses may be critical to using mobile banking. Poor system quality may lead users to feel that service providers have not spent enough effort and investment on mobile banking. This will affect their evaluation on the credibility and benevolence of service providers. Vance *et al.* (2008) reported that system quality including navigational structure and visual appeal affects users' trust in mobile commerce technologies. In addition, system quality may also affect perceived usefulness. Poor system quality will decrease user expectation of acquiring positive outcomes in future. For example, if users often encounter service interruption or unavailability, they will not be able to conduct ubiquitous payment. This may lower their perception of mobile banking utility:

- H3. System quality positively affects initial trust.
- H4. System quality positively affects perceived usefulness.

#### *Structural assurance*

Structural assurance means that there exist legal and technological structures to ensure payment security. Compared to online banking, mobile banking is built on mobile networks and may be more vulnerable to hacker attack and information interception. Viruses and Trojan horses may also exist in mobile terminals. These problems will incur users' concern on their account and payment security. Structural assurance as an institution-based trust mechanism has been found to affect users' initial trust (McKnight *et al.*, 2002b). Especially, due to the lack of direct experience, users may rely much on these structural assurances to build their trust in mobile banking. According to trust transference mechanism, users will transfer their trust in third parties to mobile banking (Pavlou and Gefen, 2004). Thus:

- H5. Structural assurance positively affects initial trust.

#### *Trust propensity*

Trust propensity reflects a user's natural tendency to trust other people (McKnight *et al.*, 2002a). Those users with high trust propensity tend to have positive attitudes

towards new technologies. Thus they will more readily build trust in mobile banking. In contrast, those users with low trust propensity may doubt the credibility of mobile banking, which represents an emerging service. Thus, we propose:

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H6. Trust propensity positively affects initial trust.

#### *Initial trust and perceived usefulness*

Trust reflects a willingness to be in vulnerability based on the positive expectations towards another party's future behavior (Mayer *et al.*, 1995). Trust often includes three dimensions: ability, integrity and benevolence (Benamati *et al.*, 2010). Ability means that mobile service providers have enough knowledge and skills to fulfill their tasks. Integrity means that mobile service providers keep their promises and do not deceive users. Benevolence means that mobile service providers will concern users' interests, not just their own interests. Perceived usefulness reflects the utility derived from using mobile banking. Initial trust will affect perceived usefulness. Trust provides a guarantee that users will acquire future positive outcomes (Gefen *et al.*, 2003). In other words, trust enables users to believe that mobile service providers have enough ability and benevolence to provide useful services to them. Thus:

H7. Initial trust positively affects perceived usefulness.

#### *Usage intention*

According to the theory of reasoned action (TRA), initial trust and perceived usefulness as beliefs will affect behavioral intention (Fishbein and Ajzen, 1975). In addition, initial trust can help mitigate perceived uncertainty and risk, and promote usage intention. Perceived usefulness has been found to be a significant factor affecting initial usage and continuance usage (Venkatesh and Davis, 2000). Much research has reported the effects of initial trust and perceived usefulness on behavioral intention (Chen and Barnes, 2007; Lu *et al.*, 2010; Shin *et al.*, 2010):

H8. Initial trust positively affects usage intention.

H9. Perceived usefulness positively affects usage intention.

Figure 1 presents the research model. Information quality, system quality, structural assurance and trust propensity are proposed to affect initial trust, which in turn affects perceived usefulness and usage intention.

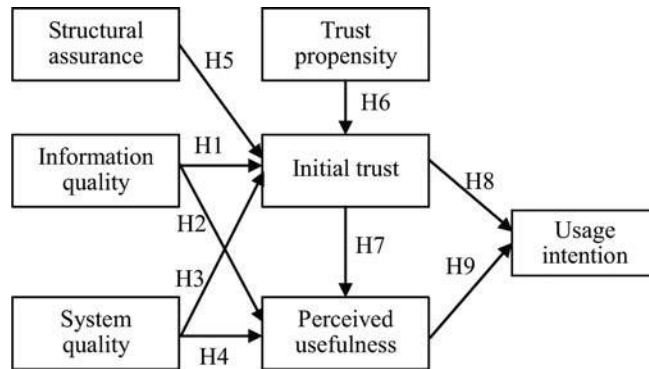
#### **Data collection**

The research model includes seven factors and each factor is measured with multiple items. All items were adapted from extant literature to improve content validity (Straub *et al.*, 2004). These items were first translated into Chinese by a researcher. Then another researcher translated them back into English to ensure consistency. When the instrument was developed, it was tested among ten users with mobile banking usage experience. Then according to their comments, we revised some items to improve the clarity and understandability. The final items and their sources are listed in the Appendix. All items were measured with a seven-point Likert scale ranging from strongly disagree (1) to strongly agree (7).

Items of information quality and system quality were adapted from Kim *et al.* (2004). Items of information quality reflect information relevancy, sufficiency, accuracy



Figure 1.  
Research model



and timeliness. Items of system quality reflect the access speed, ease of use, navigation and appearance of mobile banking. Items of structural assurance were adapted from McKnight *et al.* (2002a) to reflect the effect of legal and technological structures. Items of trust propensity were adapted from Koufaris and Hampton-Sosa (2004) to reflect a user's natural tendency to trust others. Items of initial trust and usage intention were adapted from Lee (2005). Items of initial trust measure mobile service providers' ability, integrity and benevolence. Items of usage intention reflect users' intention to use and continue using mobile banking. Items of perceived usefulness were adapted from Agarwal and Karahanna (2000) to reflect the improvement of living and working performance and effectiveness associated with using mobile banking.

Data were collected at two service halls of China Mobile, which is the largest mobile telecommunication operator in China. These service halls were located in an eastern China city, where mobile commerce is relatively better developed than other regions. We randomly contacted users and enquired of them whether they had mobile banking usage experience. Then we asked those with negative answers to experience mobile banking via the mobile phone provided by us. This was to ensure that it was the first time for them to use mobile banking as we focused on initial trust in this research. These mobile phones had installed mobile banking software developed by a reputable bank. The respondents were asked to use mobile banking for five to ten minutes. They can access various services, such as account balance enquiry, transference and bill payment. Then they were asked to fill the questionnaires based on this initial usage experience. We scrutinized all questionnaires and dropped those with too many missing values. As a result, we obtained 210 valid responses. Among them, 55.2 percent were male and 44.8 percent were female. In terms of education, over half of them (58.6 percent) held bachelor degree. Most of them (85.7 percent) used mobile Internet for over five times each week. About 62.9 percent of respondents have been the clients of the investigated bank for three years.

We conducted two tests to examine the common method variance (CMV). First, we conducted a Harman's single-factor test (Podsakoff *et al.*, 2003). The results indicated that the largest variance explained by individual factor is 12.126 percent. Thus none of the factors can explain the majority of the variance. Second, we modeled all items as the indicators of a factor representing the method effect (Malhotra *et al.*, 2006). The results indicated a poor fitness. For example, the goodness of fit index (GFI) is 0.669 (< 0.90), and the root mean square error of approximation (RMSEA) is 0.141 (> 0.08). With both tests, we feel that CMV is not a significant problem in our research.

## Data analysis

Following the two-step approach recommended by Anderson and Gerbing (1988), we first examined the measurement model to test reliability and validity. Then we examined the structural model to test research hypotheses and model fitness.

First, we conducted a confirmatory factor analysis (CFA) to examine the validity. Validity includes convergent validity and discriminant validity. Convergent validity measures whether items can effectively reflect their corresponding factor, whereas discriminant validity measures whether two factors are statistically different. Table I lists the standardized item loadings, average variance extracted (AVE), composite reliability (CR) and Cronbach Alpha values. Most item loadings are larger than 0.7 and *t* values indicate that all loadings are significant at 0.001. All AVEs exceed 0.5 and all CRs exceed 0.7. Thus the scale has a good convergent validity (Bagozzi and Yi, 1988; Gefen *et al.*, 2000). In addition, all Alpha values are larger than 0.7, showing a good reliability (Nunnally, 1978).

To examine the discriminant validity, we compared the square root of AVE with factor correlation coefficients. As listed in Table II, for each factor, the square root of AVE is larger than its correlation coefficients with other factors, showing a good discriminant validity (Fornell and Larcker, 1981; Gefen *et al.*, 2000).

Second, we employed structural equation modeling (SEM) software LISREL 8.72 to estimate the structural model. Table III lists the path coefficients and their significance.

Factor	Item	Standardized loading	AVE	CR	Alpha
Information quality (INF)	INF1	0.740	0.56	0.84	0.83
	INF2	0.774			
	INF3	0.756			
	INF4	0.719			
System quality (SYS)	SYS1	0.696	0.53	0.82	0.81
	SYS2	0.700			
	SYS3	0.807			
	SYS4	0.712			
Structural assurance (SA)	SA1	0.647	0.52	0.76	0.76
	SA2	0.708			
	SA3	0.791			
Trust propensity (PRO)	PRO1	0.761	0.63	0.84	0.84
	PRO2	0.822			
	PRO3	0.805			
Initial trust (TRU)	TRU1	0.756	0.58	0.81	0.80
	TRU2	0.766			
	TRU3	0.762			
Perceived usefulness (PU)	PU1	0.902	0.66	0.85	0.84
	PU2	0.847			
	PU3	0.675			
Usage intention (USE)	USE1	0.852	0.64	0.84	0.84
	USE2	0.816			
	USE3	0.732			

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**Table I.**  
Standardized item  
loadings, AVE, CR and  
alpha values



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Table IV lists the recommended and actual values of some fit indices. Except GFI, other fit indices have a better actual value than the recommended value, showing a good fitness (Gefen *et al.*, 2000). The explained variance of initial trust, perceived usefulness and usage intention is 68.7 percent, 55.5 percent and 52.5 percent, respectively.

We conducted a post-hoc analysis to examine the mediation effects of both initial trust and perceived usefulness. We added four direct paths from information quality, system quality, structural assurance and trust propensity to usage intention, and re-estimated the model. The results indicate that none of the paths is significant at 0.05. In addition, the chi-square difference between the new model and original model is insignificant ( $\Delta\chi^2(4) = 7.74$ ,  $p = 0.11$ ). The increased explained variance of usage intention (from 52.5 percent to 53 percent) is trivial. Thus initial trust and perceived usefulness fully mediate the effects of four determinants on usage intention (Baron and Kenny, 1986).

**Table II.**  
The square root of AVE  
(shown in italics at  
diagonal) and factor  
correlation coefficients

	INF	SYS	SA	PRO	TRU	PU	USE
INF	<i>0.748</i>						
SYS	0.599	<i>0.730</i>					
SA	0.358	0.434	<i>0.718</i>				
PRO	0.320	0.393	0.256	<i>0.796</i>			
TRU	0.550	0.539	0.522	0.528	<i>0.761</i>		
PU	0.541	0.539	0.364	0.388	0.577	<i>0.814</i>	
USE	0.568	0.506	0.396	0.333	0.558	0.543	<i>0.802</i>

**Table III.**  
Path coefficients and  
their significance

Hypothesis	Path	Coefficient	Supported or not
H1	Information quality → Initial trust	0.33***	Yes
H2	Information quality → Perceived usefulness	0.24**	Yes
H3	System quality → Initial trust	0.16*	Yes
H4	System quality → Perceived usefulness	0.25**	Yes
H5	Structural assurance → Initial trust	0.36***	Yes
H6	Trust propensity → Initial trust	0.26**	Yes
H7	Initial trust → Perceived usefulness	0.35***	Yes
H8	Initial trust → Usage intention	0.42***	Yes
H9	Perceived usefulness → Usage intention	0.37***	Yes

**Notes:** \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ )

**Table IV.**  
The recommended and  
actual values of fit indices

Fit indices	chi <sup>2</sup> /df	GFI	AGFI	CFI	NFI	NNFI	RMSEA
Recommended value	< 3	> 0.90	> 0.80	> 0.90	> 0.90	> 0.90	< 0.08
Actual value	1.990	0.848	0.805	0.968	0.938	0.962	0.069

**Notes:** Chi<sup>2</sup>/df is the ratio between Chi-square and degrees of freedom; GFI is Goodness of Fit Index; AGFI is the Adjusted Goodness of Fit Index; CFI is the Comparative Fit Index; NFI is the Normed Fit Index; NNFI is the Non-Normed Fit Index; RMSEA is Root Mean Square Error of Approximation)

## Discussion

As listed in Table III, all hypotheses are supported. Structural assurance, information quality, trust propensity and system quality affect initial trust, whereas information quality and system quality affect perceived usefulness. In addition, initial trust affects perceived usefulness and both factors determine usage intention.

Among the factors affecting initial trust, structural assurance and information quality have relatively larger effects. These results are consistent with prior findings (Zahedi and Song, 2008; Gu *et al.*, 2009; Kim *et al.*, 2009). Mobile banking based on wireless networks involves great uncertainty and risk. Thus users need to rely on structural assurances to ensure their payment security and build their trust in mobile banking. Mobile service providers can use advanced encryption technologies such as secured socket layer (SSL) and third-party certification to engender users' initial trust. Information quality reflects information accuracy, relevancy and timeliness. Quality information will signal service providers' trustworthiness. On the other hand, if information quality is poor, users may feel that mobile service providers lack the ability and benevolence to provide quality services to them. This will decrease their trust. Mobile service providers can provide personalized information and services to users based on their account balance and payment records. This may help build users' trust. Trust propensity also has a significant effect on initial trust. Thus users with high trust propensity will more readily build initial trust in mobile banking. System quality has a relatively low effect on initial trust. Compared to information quality, system quality may be more easily improved with advanced technologies. Thus users mainly rely on information quality to build their trust in mobile banking.

Both information quality and system quality have significant effects on perceived usefulness. Users expect to conduct payment via mobile banking at anytime from anywhere. Thus the low quality information and system will decrease their evaluation on the utility of mobile banking. For example, if mobile banking has a slow access speed, users may need to wait a long time for the response. They may also encounter service unavailability or interruption because of the unreliable system. These problems will lower users' perception of mobile banking utility. Thus mobile service providers need to present quality information and system to users. Especially, due to the constraints of mobile terminals such as small screens and inconvenient input, mobile service providers need to present users with a well-designed interface, including clear layout, powerful navigation and prompt response (Lee and Benbasat, 2004). Otherwise, users may feel difficult to use mobile banking. This will significantly decrease their perceived usefulness. In addition, users often need to download, install and configure the relevant software according to their mobile phone type before they can use mobile banking for the first time. This process may be complex for initial users. Mobile service providers can provide online tutorial and help to users. This may improve their perceived ease of use of mobile banking.

Initial trust affects perceived usefulness, and both factors predict usage intention. Initial trust provides a guarantee that users can adopt mobile banking to meet their expectations, such as the improvement of living and working performance. In addition, both initial trust and perceived usefulness as enablers will facilitate user adoption and usage of mobile banking. These results provide further support to extant findings (Kim *et al.*, 2009; Shin *et al.*, 2010).

**Theoretical and managerial implications**

From a theoretical perspective, this research examined the effect of initial trust on mobile banking user adoption. As noted in the literature review, although initial trust has received considerable attention in the electronic commerce context, it has seldom been examined in the mobile commerce context, especially with mobile banking that involves great risk. Thus we need to extend extant findings to mobile banking context. On the other hand, extant research has mainly adopted information technology adoption theories such as TAM, IDT and UTAUT to explain mobile user behavior (Mallat, 2007; Kim *et al.*, 2010; Schierz *et al.*, 2010), and has seldom examined the effect of initial trust on mobile banking user adoption. However, the high perceived risk and low switching cost highlight the necessity to build initial trust to facilitate user behavior. Thus it is necessary to identify the factors affecting initial trust in mobile banking. We find that structural assurance and information quality are the main factors affecting initial trust. This advances our understanding of mobile banking user behavior. The results indicate that initial trust affects perceived usefulness, and both factors have mediation effects on usage intention. Thus initial trust and perceived usefulness act as enablers of user behavior. Future research can examine the effect of inhibitors such as switching cost on user behavior.

From a managerial perspective, our results imply that mobile service providers need to engender users' initial trust in order to facilitate their adoption and usage of mobile banking. They cannot just focus on technological perceptions such as perceived usefulness when promoting user behavior. We found that structural assurance has a strong effect on initial trust. Thus mobile service providers need to adopt legal and technological structures such as third-party certifications to ensure payment security. The results also indicate that compared to system quality, information quality has a larger effect on initial trust. System quality may be rapidly improved with advanced technologies, whereas information quality improvement will require mobile service providers' continuous effort and resources investment. Thus information quality acts as a stronger trust signal. This suggests that mobile service providers need to attach great importance to delivering quality information to users.

**Conclusion**

Mobile banking as an emerging service has not been widely adopted by users. Thus it is necessary to identify the factors affecting user adoption. Due to the high risk and low switching cost, building users' initial trust is critical for mobile banking service providers. The purpose of this research is to examine the effect of initial trust on mobile banking user adoption. The results indicate that structural assurance and information quality are the main factors affecting initial trust, whereas both information quality and system quality affect perceived usefulness. Initial trust affects perceived usefulness and both factors predict usage intention. Thus mobile service providers need to highlight improving initial trust in order to facilitate users' adoption and usage of mobile banking.

This research has the following limitations. First, we collected data in China, where mobile commerce is developing rapidly but still in its early stage. Thus our results need to be generalized to other countries with developed mobile commerce. Second, we did not consider the effect of bank reputation on initial trust. Due to the lack of direct usage experience, users may rely on trust signals such as reputation to build their initial trust

in mobile banking. Future research can examine this possible effect. Third, users often need to bear some usage costs, such as communication fees and transactions fees when using mobile banking. These costs may also affect user trust in service providers' ability and benevolence. Future research can explore the effect of perceived cost on initial trust. Fourth, our sample was mainly composed of users having rich mobile Internet experience, which may affect their trust in mobile banking. Future research needs to generalize our results to other samples, such as those inexperienced users.

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**Appendix. Measurement scale and items**

*Information quality (INF) (adapted from Kim et al. (2004))*

INF1: Mobile banking provides me with information relevant to my needs.

INF2: Mobile banking provides me with sufficient information.

INF3: Mobile banking provides me with accurate information.

INF4: Mobile banking provides me with up-to-date information.

*System quality (SYS) (adapted from Kim et al. (2004))*

SYS1: Mobile banking quickly loads all the text and graphics.

SYS2: Mobile banking is easy to use.

SYS3: Mobile banking is easy to navigate.

SYS4: Mobile banking is visually attractive.

*Structural assurance (SA) (adapted from McKnight et al. (2002a))*

SA1: I feel confident that encryption and other technological advances on the mobile Internet make it safe for me to use mobile banking.

SA2: I feel assured that legal and technological structures adequately protect me from payment problems on the mobile Internet.

SA3: Mobile Internet is a robust and safe environment in which to use mobile banking.

*Trust propensity (PRO) (adapted from Koufaris and Hampton-Sosa (2004))*

PRO1: It is easy for me to trust a person/thing.

PRO2: I tend to trust a person/thing, even though I have little knowledge of it.

PRO3: My tendency to trust a person/thing is high.

*Initial trust (TRU) (adapted from Lee (2005))*

TRU1: Mobile banking is trustworthy.

TRU2: Mobile banking keeps its promise.

TRU3: Mobile banking keeps customers' interests in mind.

*Perceived usefulness (PU) (adapted from Agarwal and Karahanna (2000))*

PU1: Using mobile banking can improve my living and working performance.

PU2: Using mobile banking can increase my living and working effectiveness.

PU3: I find that mobile banking is useful.

*Usage intention (USE) (adapted from Lee (2005))*

USE1: Given the chance, I intend to use mobile banking.

USE2: I expect my use of mobile banking to continue in future.

USE3: I have intention to use mobile banking to conduct payment.

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